ENTERASYS

NetSight

Element Manager 2.2.1

Generic SNMP
User Guide

Notice

Enterasys Networks reserves the right to make changes in specifications and other information contained in this document without prior notice. The reader should in all cases consult Enterasys Networks to determine whether any such changes have been made.

The hardware, firmware, or software described in this manual is subject to change without notice.

IN NO EVENT SHALL CABLETRON SYSTEMS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS MANUAL OR THE INFORMATION CONTAINED IN IT, EVEN IF CABLETRON SYSTEMS HAS BEEN ADVISED OF, KNOWN, OR SHOULD HAVE KNOWN, THE POSSIBILITY OF SUCH DAMAGES.

Virus Disclaimer

Enterasys Networks has tested its software with current virus checking technologies. However, because no anti-virus system is 100% reliable, we strongly caution you to write protect and then verify that the Licensed Software, prior to installing it, is virus-free with an anti-virus system in which you have confidence.

Enterasys Networks makes no representations or warranties to the effect that the Licensed Software is virus-free.

Printed in the United States of America.

Order Number: 9031620-04 April 2000

Enterasys Networks
P.O. Box 5005
Rochester, NH 03866-5005

Restricted Rights Notice

(Applicable to licenses to the United States Government only.)

1. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

   Enterasys Networks , 35 Industrial Way, Rochester, New Hampshire 03867-0505.

2. (a) This computer software is submitted with restricted rights. It may not be used, reproduced, or disclosed by the Government except as provided in paragraph (b) of this Notice or as otherwise expressly stated in the contract.

   (b) This computer software may be:

   (1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;

   (2) Used or copied for use in a backup computer if any computer for which it was acquired is inoperative;

   (3) Reproduced for safekeeping (archives) or backup purposes;

   (4) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software incorporating restricted computer software are made subject to the same restricted rights;

   (5) Disclosed to and reproduced for use by support service contractors in accordance with subparagraphs (b) (1) through (4) of this clause, provided the Government makes such disclosure or reproduction subject to these restricted rights; and

   (6) Used or copied for use in or transferred to a replacement computer.

   (c) Notwithstanding the foregoing, if this computer software is published copyrighted computer software, it is licensed to the Government, without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this clause.

   (d) Any other rights or limitations regarding the use, duplication, or disclosure of this computer software are to be expressly stated in, or incorporated in, the contract.

   (e) This Notice shall be marked on any reproduction of this computer software, in whole or in part.

Contents

Chapter 1 Introduction

Chapter 2 System Group

Chapter 3 Viewing the Interface Group

Chapter 4 Using the Address Translation Table

Chapter 5 Viewing IP Group Statistics

Chapter 6 Viewing the IP Address Table

Introduction

How to use this guide; related guides; useful definitions; software conventions; getting help

Welcome to the ***Generic SNMP User's Guide.*** This guide is a reference for using NetSight Element Manager to manage and control any SNMP-compliant devices on your network.

Using the Generic SNMP User's Guide

This guide contains information about software functions which are accessed directly from the Generic SNMP icon or the System Group option available from the Device menu. Each chapter in this guide describes one major group window available for Generic SNMP management.

Chapter 1, **Introduction**, discusses the capabilities of Generic SNMP management from NetSight Element Manager. This chapter includes a list of related guides, recommended books, and SNMP definitions.

Chapter 2, **System Group**, describes the System Group window and its related options. The System Group window is the initial window for Generic SNMP; it displays summary and identification information about the SNMP device and provides a menu for accessing other Generic SNMP windows.

Chapter 3, **Viewing the Interface Group**, discusses the Interface Group window, which displays the number and types of packets received at and transmitted from each interface on the monitored device.

Chapter 4, **Using the Address Translation Table**, allows you to view and modify the mapping of IP Addresses and Physical Addresses via the Address Resolution Protocol (ARP).

Chapter 5, **Viewing IP Group Statistics**, describes the Internet Protocol Group window and its associated fields, including the Time To Live option.

Chapter 6, **Viewing the IP Address Table**, discusses the use of the Internet Protocol Address Table.

Chapter 7, **Using the IP Routing Table Window**, discusses the IP Routing Table and how to route data through your network.

Chapter 8, **Using the Net to Media Table**, discusses the IP Address Translation Table used for mapping IP addresses to physical addresses for IP datagrams.

Chapter 9, **Viewing ICMP Group Statistics**, discusses the Internet Control Message Protocol Group window, which summarizes ICMP message traffic.

Chapter 10, **Viewing TCP Group Information**, describes the Transmission Control Protocol Group window, which provides TCP statistics and displays current TCP connections.

Chapter 11, **Viewing UDP Group Information**, discusses the User Datagram Protocol Group window and UDP datagram statistics.

Chapter 12, **Viewing EGP Group Information**, discusses the Exterior Gateway Protocol Group window, which provides information about router communications on your network.

Chapter 13, **Viewing SNMP Group Information**, describes the SNMP Group window, which displays SNMP message traffic statistics and lets you enable and disable authentication-failure traps.

Related Manuals

The ***Generic SNMP User's Guide*** is only part of a complete document set designed to provide comprehensive information about the features available to you through NetSight Element Manager. Other guides which include information related to managing Generic SNMP devices include:

User's Guide

Tools Guide

Remote Administration Tools User's Guide

Remote Monitoring (RMON) User's Guide

Alarm and Event Handling User's Guide

Network Troubleshooting Guide

For more information about the capabilities of the SNMP device, consult the appropriate hardware documentation.

Useful Definitions

To help you use Generic SNMP management, we are providing a list of basic definitions that are applicable to TCP/IP networks and SNMP management. This list should not be taken as all-inclusive.

Active open

A sequence of events occurring when an entity using an application protocol of the Internet suite (such as SMTP—the E-mail protocol; FTP—File Transfer Protocol; or Telnet—terminal service protocol) directs the Transmission Control Protocol to establish a connection over the physical medium with another user(s) of the application’s particular service. See **Transmission Control Protocol (TCP)**, page 1-6, for more information.

Address mask

A bit mask that is used to select bits from an IP address for subnet addressing. The mask is 32 bits long and selects the network portion of the IP address and one or more bits of the local portion. See **Subnet mask**, page 1-6, for more information.

Address Resolution Protocol (ARP)

The Internet protocol that dynamically maps destination IP addresses to physical media (Ethernet and other) addresses. This is needed so that a datagram addressed to logical address can reach the correct physical media address.

If the addresses are already mapped in transmitting device’s ARP cache (address matching tables), the datagram can be sent directly.

Broadcast address

A physical or IP address referring to all stations on the media.

Connection

A logical binding between two or more users of a service so that data can be transferred.

Connection-less mode

A service that has a single phase which combines both transmission control mechanisms (e.g., addressing) and data transfer.

Connection-oriented mode

A service that divides into three phases: establishment, in which two or more users are bound to a connection; data transfer, in which the users exchange data; and release, in which the connection is discarded.

Datagram

A self-contained unit of data, with an associated destination IP address and upper-layer protocol number, that is used in series to transmit a whole body of data from one device to another to the correct service layer protocol.

Device

A network element.

Exterior Gateway Protocol (EGP)

An older protocol used by gateways in a two-level internet (autonomous internet sites are connected to the Internet through core gateways). All traffic received from or transmitted between internet sites passes through the core gateway(s).

Therefore, a site's core gateway must have routing information on all networks available within the autonomous site, and must be able to pass reachability (of other Internet sites) information (using EGP) to each network gateway in that site.

Flags

The control bits indicating special functions for a TCP segment; for example, if the datagram is allowed to be fragmented, and if so, whether other later fragments exist.

Fragment

An IP datagram containing only a portion of the user-data from a larger IP datagram. A datagram will be fragmented if its size is too large to be encapsulated within the legal limits of a frame's data field of the medium on which it is transmitted (e.g., a datagram over 1500 bytes would be fragmented if it were to be transmitted on an Ethernet network).

Fragmentation

The process of breaking an IP datagram into smaller parts, such that each fragment can be transmitted in whole on a given physical medium.

Gateway

A router (for the purposes of this manual).

Internet

A large collection of connected networks, primarily in the United States, running the Internet suite of protocols, also known as the DARPA Internet.

Internet Control Message Protocol (ICMP)

A simple protocol that provides low-level feedback that informs the internet layer about its operating status. Control messages supported by this protocol include destination unreachable; datagram discards because of timer expirations; IP header problems; discards at a destination because of a lack of resources; redirects to a gateway closer than the device's default one; IP address reachability tests and results; delay times between transmission and reception of datagrams; and IP network address and address mask requests.

Internet Protocol (IP)

The network protocol offering a connectionless mode network service in the Internet Suite of protocols, in which address resolution and data transfer are completed in a single phase.

Management Information Base (MIB)

A collection of objects (organized in accordance with the Structure of Management Information) implemented in a network device, so that the device can be accessed and managed by a network management protocol, such as SNMP. Objects allow a device to be monitored (have information retrieved from it by a management station); to be controlled (allow remote configuration of the device, such as switching the operational state of a port); and to report abnormal events to the management station (e.g., collision threshold exceeded).

Maximum transmission unit (MTU)

The largest amount of user-data (e.g. the largest size of an IP datagram) that can be sent in a single frame on a particular medium.

Passive open

A sequence of events occurring when an entity using an application protocol of the Internet suite (e.g., SMTP, FTP, SNMP, or Telnet) informs the Transmission Control Protocol that it is willing to accept a connection to another user of the application's particular service. See **Transmission Control Protocol (TCP)**, page 1-6, for more information.

Ports

Integer quantities which identify to a transport protocol (UDP or TCP) the particular application entity (e.g., SMTP, FTP, SNMP, or Telnet) used in the transmission / reception of the data (e.g., UDP uses a port value of 161 decimal to identify SNMP data).

Protocol Data Unit (PDU)

A unit of information, which uses a protocol to offer a service, that is exchanged by protocol machines, A PDU usually contains protocol control information (a header identifying data to be transferred) and user data.

Reassembly

The process of recombining fragments, at the final destination, into the original datagram.

Retransmission

The process of a source TCP entity resending a unit of data while waiting for an acknowledgment of receipt by the destination TCP entity. Each time a source TCP entity transmits a segment, it starts a retransmission timer. If this timer expires before an acknowledgment from the destination, the segment will be transmitted and the timer will be restarted. Retransmission can occur only a certain number of times until the transmitting entity aborts the connection.

Segment

The unit used for data exchange between two entities using TCP.

Socket

A pairing of an IP address (destination or source) and a TCP port number. The pairing of two internet sockets (destination and source IP addresses and TCP ports) forms a connection.

Simple Network Management Protocol (SNMP)

The application protocol which offers network management services in the Internet suite of protocols. SNMP provides four operations for network management via a device's MIB (its manageable objects): get (retrieval of specific management information), get-next (retrieval of management information in series by traversing the MIB), set (manipulation of management information), and trap (reports on extraordinary events at the device).

Subnet

A physical network within the IP network.

Subnet mask

A 32-bit quantity (four binary octets) that filters a destination IP address to determine whether it exists on the source IP’s subnetwork and therefore can be reached directly, or must be forwarded through a gateway or router.

In the mask, all bits in the source IP address that correspond to its network portion (both site and subnet identifying bits) are set to 1, and all bits that correspond to the host portion are set to 0. The destination IP address is logically ANDed with the mask to determine its network portion. Its network portion is then compared to the network portion of the source. If the network portions match, the frame is transmitted directly; if they do not, the frame is routed.

Time to live

The upper bound, in seconds, that a datagram may be processed within the internet. Each time the datagram passes through the internet layer on any network device, the IP entity must decrement this field by at least one. If the field reaches zero at an intermediary device before reaching its intended destination, the datagram is discarded.

Transmission Control Protocol (TCP)

The Internet suite protocol which transports IP datagrams via a connection-oriented service. A connection oriented service requires that the interface layer (that responsible for transmitting datagrams on a single physical medium, e.g., Ethernet) perform connection management to find an underlying connection on which to transmit the datagram.

User Datagram Protocol (UDP)

The protocol offering a connectionless-mode transport service in the Internet suite of protocols. A UDP datagram contains source and destination ports, a length field, a checksum, and user-data from the upper layer protocol.

Software Conventions

NetSight Element Manager’s device user interface contains a number of elements which are common to most windows and which operate the same regardless of the window in which they appear. A brief description of some of the most common elements appears below.

NOTE

In accordance with Year 2000 compliance requirements, NetSight Element Manager displays and allows you to set all dates with four-digit year values.

Using the Mouse

This document assumes you are using a Windows-compatible mouse with two buttons; if you are using a three-button mouse, you should ignore the operation of the middle button when following procedures in this document. Procedures within the NetSight Element Manager document set refer to these buttons as follows:

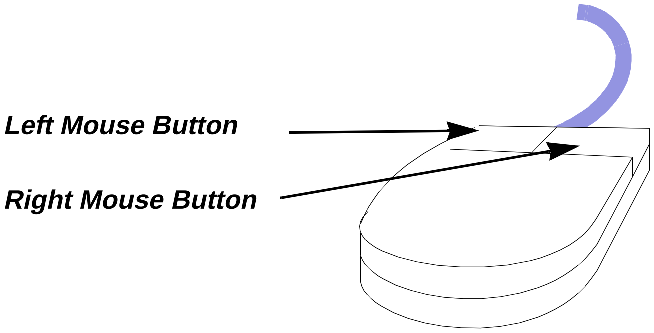


Figure 1-1. Mouse Buttons

For many mouse operations, this document assumes that the left (primary) mouse button is to be used, and references to activating a menu or button will not include instructions about which mouse button to use.

However, in instances in which right (secondary) mouse button functionality is available, instructions will explicitly refer to **right** mouse button usage. Also, in situations where you may be switching between mouse buttons in the same area or window, instructions may also explicitly refer to both **left** and **right** mouse buttons.

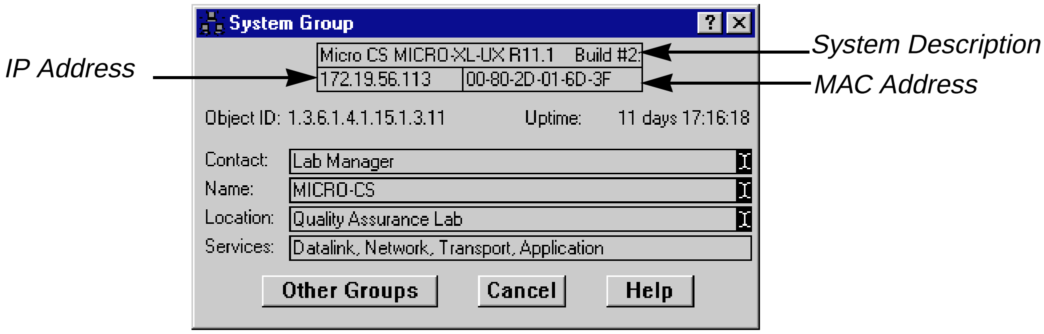
Instructions to perform a mouse operation include the following terms:

- **Pointing** means to position the mouse cursor over an area without pressing either mouse button.
- **Clicking** means to position the mouse pointer over the indicated target, then press and release the appropriate mouse button. This is most commonly used to select or activate objects, such as menus or buttons.
- **Double-clicking** means to position the mouse pointer over the indicated target, then press and release the mouse button two times in rapid succession. This is commonly used to activate an object’s default operation, such as opening a window from an icon. Note that there is a distinction made between “click twice” and “double-click,” since “click twice” implies a slower motion.
- **Pressing** means to position the mouse pointer over the indicated target, then press and hold the mouse button until the described action is completed. It is often a pre-cursor to Drag operations.

- **Dragging** means to move the mouse pointer across the screen while holding the mouse button down. It is often used for drag-and-drop operations to copy information from one window of the screen into another, and to highlight editable text.

Common Generic SNMP Window Fields

Similar descriptive information is displayed in text boxes at the top of most device-specific windows in NetSight Element Manager, as illustrated in Figure 1-2.



Micro CS MICRO-XL-UX R11.1 Build #2:

172.19.56.113 00-80-2D-01-6D-3F

Object ID: 1.3.6.1.4.1.15.1.3.11 Uptime: 11 days 17:16:18

Contact: Lab Manager

Name: MICRO-CS

Location: Quality Assurance Lab

Services: Datalink, Network, Transport, Application

Figure 1-2. Sample Window Showing Informational Text Boxes

System Description

Displays a textual description of the device. This description usually includes the full name of the device, the version number of the system's hardware type, the software operating-system, and networking software.

IP Address

Displays the device's IP (Internet Protocol) Address; this will be the IP address used to define the device icon. IP addresses are assigned via Local Management for the SNMP device; they cannot be changed via NetSight Element Manager.

MAC Address

Displays the manufacturer-set MAC address associated with the IP address used to define the device icon created via NetSight Element Manager. This address is factory-set and cannot be altered.

Using Window Buttons

The **Cancel** button that appears at the bottom of most windows allows you to exit a window and terminate any unsaved changes you have made. You may also have to use this button to close a window after you have made any necessary changes and set them by clicking on an **OK**, **Set**, or **Apply** button.

An **OK**, **Set**, or **Apply** button appears in windows that have configurable values; it allows you to confirm and SET changes you have made to those values. In some windows, you may have to use this button to confirm each individual set; in other windows, you can set several values at once and confirm the sets with one click on the button.

The **Help** button brings up a **Help** window with information specific to the current window. For more information, see **Getting Help**, page 1-9.

The command buttons, for example **Bridge**, launch a menu listing the windows, or commands available for that topic.

Any menu topic followed by ... (three dots)—for example **Statistics...**— launches a window associated with that selection.

Getting Help

This section describes different methods of getting help for questions or concerns you may have while using NetSight Element Manager.

Using On-line Help

You can use the Generic SNMP window **Help** buttons to obtain information specific to the device. When you click on a **Help** button, a window will appear which contains context-sensitive on-screen documentation that will assist you in the use of the windows and their associated command and menu options. Note that if a **Help** button is grayed out, on-line help has not yet been implemented for the associated window.

NOTE

*All of the online help windows use the Microsoft Windows help facility. If you are unfamiliar with this feature of Windows, you can select **Help** from the Windows **Start** menu, or **Help —> How to Use Help** from the primary NetSight Element Manager window.*

Accessing On-line Documentation

The complete suite of documents available for NetSight Element Manager can be accessed via a menu option from the primary window menu bar:
Help —> **Online Documents**. If you installed the documentation component, selecting this option will launch Adobe's Acrobat Reader and a menu file which provides links to all other available documents.

TIP

*If you have not yet installed the documentation, the **Online Documents** option will not be able to access the menu file; in order to activate this option, you must run* setup.exe *again to install the documentation component. See the* **Installation Guide** *for details.*

Getting Help from the Global Technical Assistance Center

If you need technical support related to NetSight Element Manager, contact the Global Technical Assistance Center via one of the following methods:

By phone:	(603) 332-9400 *24 hours a day, 365 days a year*
By fax:	(603) 337-3075
By mail:	Enterasys Technical Support 35 Industrial Way Rochester, NH 03867
By e-mail:	support@enterasys.com
FTP:	ftp.ctron.com (134.141.197.25)
Login	`anonymous`
Password	`your email address`
By BBS:	(603) 335-3358
Modem Setting	8N1: 8 data bits, 1 stop bit, No parity

Send your questions, comments, and suggestions regarding NetSight documentation to NetSight Technical Communications via the following e-mail address:

Netsight_docs@enterasys.com

To locate product specific information, refer to the Enterasys Web site at the following address:

http://www.enterasys.com

Chapter 2

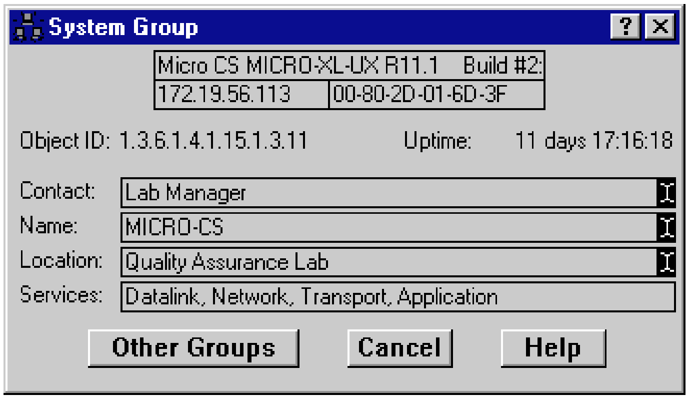
System Group

The System Group window; using the Other Groups menu

The System Group window provides basic information about the type of device currently being monitored, including the System Object ID and Uptime, as well as administrative information, including the device's name, location, contact person, and the level of Open Systems Interconnection (OSI) services. You can access all other Generic SNMP windows from the System Group window.

To open the System Group window from the Device View or Chassis View window of any SNMP-compliant device:

1. Select **Device—>System Group** in the Chassis View or Device View menu bar. The System Group window as shown in**,** Figure 2-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 00-80-2D-01-6D-3F

Object ID: 1.3.6.1.4.1.15.1.3.11 Uptime: 11 days 17:16:18

Contact: Lab Manager
Name: MICRO-CS
Location: Quality Assurance Lab
Services: Datalink, Network, Transport, Application

Figure 2-1. System Group Window

The System Group window displays the following fields:

Object ID
Displays the unique identifier of the device being managed. This value is allocated within the SMI enterprises subtree (1.3.6.1.4.1).

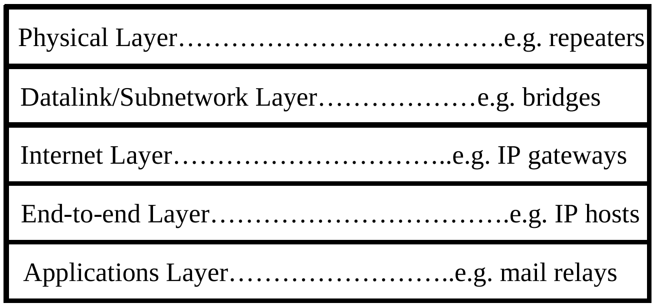
Uptime
Displays the amount of time that the device has been running since the network management portion of the system was last initialized. This is converted from hundredths of a second (as stored in the device MIB) into a more useful days, HH:MM:SS format.

Contact
Displays a text field which you can use to enter the name and / or telephone number of the person responsible for the device.

Name
Displays a text field which you can use to assign a name for the device.

Location
Displays a text field which you can use to describe the node's physical location.

Services
Displays the level of OSI (Open Systems Interconnection) services supported by the device, examples of which are given in Figure 2-2.



Physical Layer……………………………….e.g. repeaters
Datalink/Subnetwork Layer………………e.g. bridges
Internet Layer…………………………..e.g. IP gateways
End-to-end Layer…………………………….e.g. IP hosts
Applications Layer……………………..e.g. mail relays

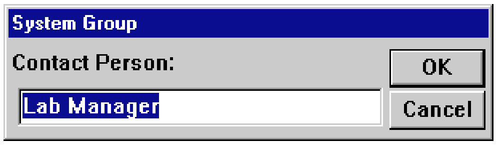
Figure 2-2. Examples of OSI Service Layers

Modifying the System Group Administrative Fields

If your device's firmware supports MIB II, you can modify the **Contact**, **Name**, and **Location** fields.

1. To modify the **Contact** field:

   a. Click the I-bar cursor (I) to the right of the **Contact** field. The Contact text box opens, Figure 2-3.



System Group

Contact Person:

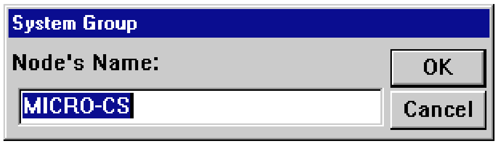
Lab Manager

Figure 2-3. Contact Text Box

b. Type in the new contact information in the text box; then click on **OK**.

2. To modify the **Name** field:

a. Click the I-bar cursor (I) to the right of the Name field. The Name text box opens, Figure 2-4.



System Group

Node's Name:

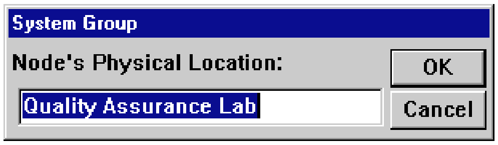
MICRO-CS

Figure 2-4. Name Text Box

b. Type in the new name in the text box; then click on **OK**.

3. To modify the location field:

a. Click on the I-bar cursor (I) to the right of the **Location** field. The Location text box opens, Figure 2-5.



System Group

Node's Physical Location:

Quality Assurance Lab

Figure 2-5. Location Text Box

b. Type in the new location in the text box; then click on **OK**.

Using the Other Groups Menu

The **Other Groups** button displays a menu (Figure 2-6), which lets you select other Generic SNMP windows supported by the device.

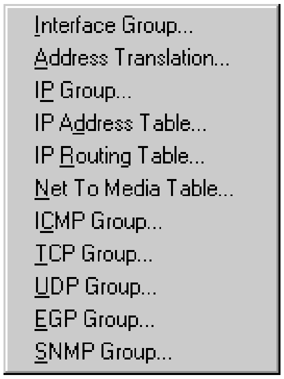


Figure 2-6. Other Group Menu

To access the Other Groups drop-down menu via the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays, as shown in Figure 2-6. Non-supported options will be grayed-out.
2. Click on the desired option. The appropriate window opens.

Chapter 3

Viewing the Interface Group

Viewing interface statistics; using the Admin/Status option and the Last Change field

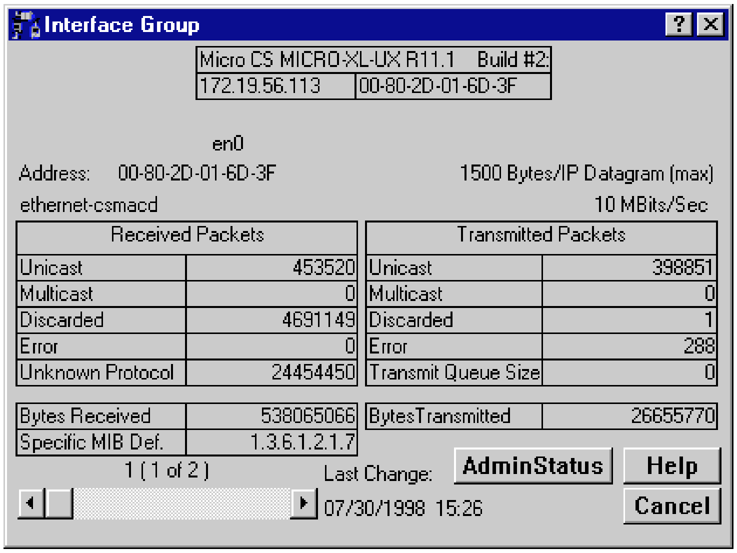
The Interface Group window displays statistics for each interface on the device. The port type is displayed for each interface along with the statistics associated with that interface. Use the scroll bar to display the other available interfaces; the interface number and the total number of interfaces on the device are displayed above the scroll bar (e.g., 1 of 27).

Statistics are gathered for network activity levels occurring at the physical and data-link layers. These statistics reflect the following types of packets being transmitted and received:

- Unicasts
- Multicasts
- Discarded Packets
- Error Packets
- Received Packets with unknown protocols
- Packets waiting to be transmitted
- Bytes

To open the Interface Group window from the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click on **Interface Group**. The Interface Group window, Figure 3-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2

172.19.56.113 | 00-80-2D-01-6D-3F

en0

Address: 00-80-2D-01-6D-3F

1500 Bytes/IP Datagram (max)

ethernet-csmacd

10 MBits/Sec

Received Packets		Transmitted Packets	
Unicast	453520	Unicast	398851
Multicast	0	Multicast	0
Discarded	4691149	Discarded	1
Error	0	Error	288
Unknown Protocol	24454450	Transmit Queue Size	0

Bytes Received	538065066	BytesTransmitted	26655770
Specific MIB Def.	1.3.6.1.2.1.7		

1 (1 of 2)

Last Change: 07/30/1998 15:26

Figure 3-1. Interface Group Window

The following fields are non-statistical interface descriptions fields:

Address

The interface’s physical address (*ifPhysAddr*) at the protocol layer immediately below the network layer in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this object should contain an octet string of zero length.

Interface Type

The type of interface (*ifType*), distinguished according to the physical/link protocol(s) immediately below the network layer in the protocol stack. MIB-II defines 32 different interface types, including ethernet-csmacd, fddi, iso88025-tokenRing, and softwareLoopBack.

MTU (Maximum Transfer Unit)

The size of the largest datagram which can be transmitted or received on the interface (specified in octets), according to the *ifMtu*. For interfaces that are used for transmitting network datagrams, this is the size of the largest network datagram that can be sent on the interface. Frames that exceed the MTU are discarded.

Speed

An estimate of the interface’s current bandwidth in bits per second, according to the *ifSpeed*. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.

Last Change

The Last Change field (bottom of the window) displays the date and the time since the system was last reinitialized.

NOTE *In accordance with Year 2000 compliance requirements, NetSight Element Manager displays and allows you to set all dates with four-digit year values.*

Viewing Statistics

The following statistics are collected from received and transmitted packets.

Unicast

The number of subnetwork unicast (sent to one station) packets received from a higher-layer protocol, according to the *ifInUcastPkts.*

The number of subnetwork unicast (sent to one station) packets delivered to a higher-layer protocol, according to the *ifOutUcastPkts.*

Multicast

The number of non-unicast (i.e., subnetwork-broadcast or subnetwork multi-cast) packets received from a higher-layer protocol, according to the *ifInNUcastPkts.*

The number of non-unicast (i.e., subnetwork-broadcast or subnetwork multi-cast) packets delivered to a higher-layer protocol, according to the *ifOutNUcastPkts.*

A multicast transmission is simultaneously sent to more than one station at a time.

Discarded

The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted, according to the *ifInDiscards*.

The number of inbound or outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable, according to the *ifOutDiscards*.

Discarding good packets indicates a very busy network (e.g. discarding packets to free up buffer space). If a device routinely discards packets it usually indicates that network traffic is overwhelming the device.

Error

The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol, according to the *ifInErrors.*

The number of outbound packets that could not be transmitted because of errors, according to the *ifOutErrors*

Unknown Protocol *(Received Packets only)*
The number of packets received via the interface which were discarded because of an unknown or unsupported protocol, according to the *ifInUnknownProtos*.

Transmit Queue Size *(Transmitted Packets only)*
The length of the output packet queue (in packets), according to the *ifOutQLen*. The amount of device memory devoted to buffer space, and the traffic level on the target network determine how large the output packet queue can grow before the device begins to discard packets.

Bytes Received
Displays the total number of inbound bytes.

Bytes Transmitted
Displays the total number of bytes transmitted onto the network.

Specific MIB Def.
Displays a MIB definition of the media being used to realize that segment's interface. A MIB definition is only available for devices whose firmware supports MIB-II.

Setting the Interface Admin Status

The Admin Status button lets you enable, disable, or test the current interface. The operational states of these three options are:

Enable — The interface will be ready to pass packets.

Disable — The interface will be in a closed state.

Test — The interface will be in some test mode and no operational packets can be passed.

To use the **Admin Status** button:

1. Click on the **Admin Status** button. The Administration Status drop-down menu displays.

2. Click on the appropriate option: **Enable**, **Disable**, or **Test**. If you choose **Disable**, a warning window opens to indicate that you may lose access to the device.

3. Click **OK** to disable the interface, or **Cancel** to nullify the disable command.

The current interface will now begin operating in the state you have selected.

Chapter 4

Using the Address Translation Table

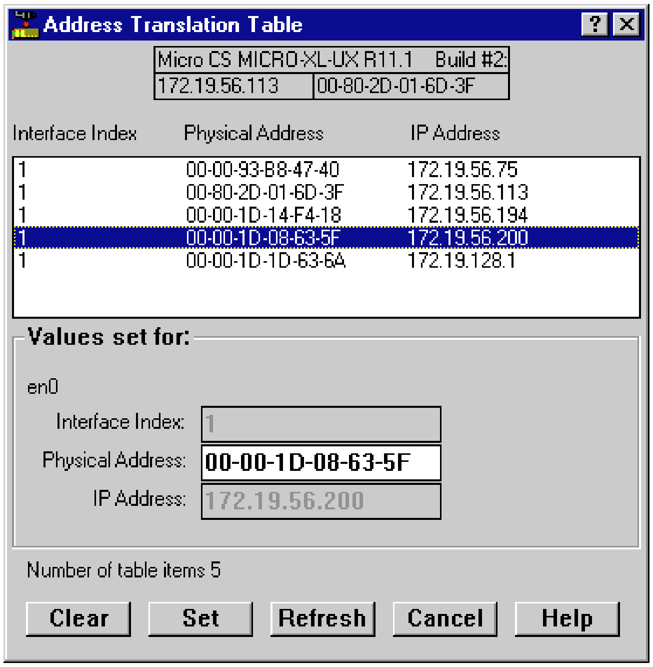
The Address Translation Table window; editing the Address Translation Table

The Address Translation Table utilizes ARP (Address Resolution Protocol) to translate IP addresses into Physical addresses. ARP is used to achieve mapping between IP addresses which are 32 bits in length and Physical addresses which are 48 bits in length. The Address Translation Table window lets you view and modify the translation of an interface’s IP address to its corresponding Physical address. You may want to change the mapping if you have installed new hardware in an SNMP device; the Physical address has changed, but the logical IP address remains the same.

To open the Address Translation Table from the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays.

2. Click on **Address Translation**. The Address Translation Table window, Figure 4-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 00-80-2D-01-6D-3F

Interface Index	Physical Address	IP Address
1	00-00-93-B8-47-40	172.19.56.75
1	00-80-2D-01-6D-3F	172.19.56.113
1	00-00-1D-14-F4-18	172.19.56.194
1	00-00-1D-08-63-5F	172.19.56.200
1	00-00-1D-1D-63-6A	172.19.128.1

Values set for:

en0

Interface Index: 1

Physical Address: 00-00-1D-08-63-5F

IP Address: 172.19.56.200

Number of table items 5

Figure 4-1. Address Translation Table Window

The display panel (upper section) of the Address Translation window lists the addresses associated with the interface. The **Values set for** section lets you add and modify entries in the panel.

Interface Index

The network interfaces on which this system can send and receive IP datagrams.

Physical Address

The media dependent MAC addresses that have been detected in datagrams processed through the indicated **Interface Index**. Note that if datagrams had been forwarded through a router interface before being received at the monitored Interface Indices, more than one IP address will be mapped to the same physical address (that of the router port forwarding datagrams).

IP Address

The logical network addresses that correspond to the physical addresses.

Editing the Address Translation Table

You can modify existing entries in, or add new entries to the Address Translation Table.

Modifying Entries in the Address Translation Table

By modifying an entry in the Address Translation Table you will change the mapping that was discovered by the ARP process.

1. Click on an entry in the Address Translation Table. That entry's corresponding values for its Port Number, Physical Address, and IP address display in the **Values set for** area.
2. Enter the desired changes in the **Physical Address** field within the **Values set for** area.
3. Click on **Set**. Status information displays above the command buttons and a confirmation window opens; if the set succeeded, the changes appear in the display panel.

NOTE

When an entry is highlighted the interface description is displayed in the ***Values for Set*** *section of the window, (e.g., Ctron SEHI EnetPort).*

Adding Entries to the Address Translation Table

1. Click on **Clear**. This allows you to enter values in the **Values set for** section.
2. Enter the **Port Number**, **Physical Address**, and **IP Address** in the appropriate fields.
3. Click on **Set**. Status information displays above the command buttons and a confirmation window opens; if the set succeeded, the new entry appears in the display panel.

NOTE

*If the Physical Address is entered in an incorrect format, an "****Invalid Ethernet Address****" message displays. Enter the address in the correct XX-XX-XX-XX-XX-XX hexadecimal format. If the IP Address is entered in an incorrect format, an "****Invalid IP Address****" message displays. Enter the address in the correct XXX-XXX-XXX-XXX format.*

Chapter 5

Viewing IP Group Statistics

The IP Group window; using the Time To Live option

The Internet Protocol (IP) is the protocol used in the Internet layer. Each IP datagram contains identifying information such as the datagram's originator, the datagram's length, the format used (version), and the quality of service.

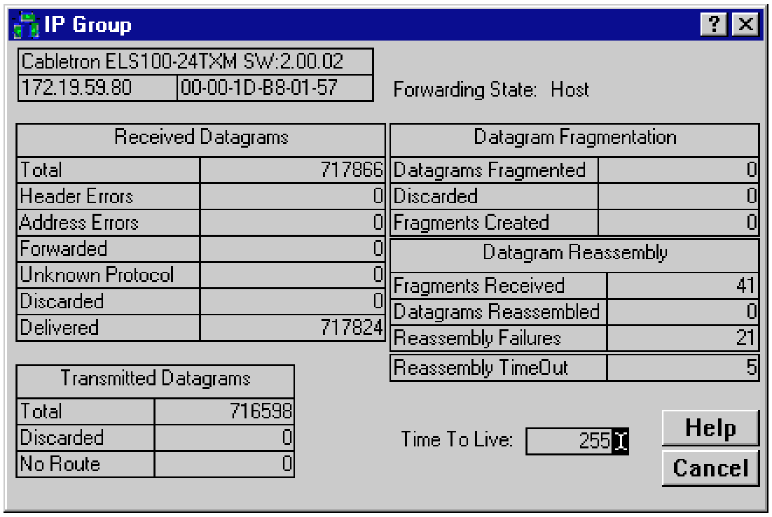
Each medium has a maximum size data field used to encapsulate an IP datagram (Maximum Transmit Unit or MTU). When a local IP entity (the device) wishes to send a datagram larger than the allowable maximum size, it must first fragment the datagram prior to transmission. The IP entity checks to see if the flags field in the datagram permits fragmentation. (If it does not, the datagram is discarded.) It then generates two or more fragments that contain a portion of the user-data from the original datagram.

These fragments are reassembled at the destination IP address. If they arrive out of order (since they may be routed over different paths), they are held (buffered) until all fragments of the original datagram have arrived. Should the fragments become lost or corrupted during transmission, then they are discarded.

The IP Group window provides a statistical breakdown of the number of datagrams received by, and transmitted from the device. Also included are the various types of fragmented and reassembled datagrams.

To open the IP Group window from the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click on **IP Group**. The IP Group window, Figure 5-1, opens.



Cabletron ELS100-24TXM SW:2.00.02
172.19.59.80 | 00-00-1D-B8-01-57

Forwarding State: Host

Received Datagrams	
Total	717866
Header Errors	0
Address Errors	0
Forwarded	0
Unknown Protocol	0
Discarded	0
Delivered	717824

Datagram Fragmentation	
Datagrams Fragmented	0
Discarded	0
Fragments Created	0

Datagram Reassembly	
Fragments Received	41
Datagrams Reassembled	0
Reassembly Failures	21
Reassembly TimeOut	5

Transmitted Datagrams	
Total	716598
Discarded	0
No Route	0

Time To Live: 255

Figure 5-1. IP Group Window

Forwarding State

Displays whether this entity is acting as an IP gateway in respect to the forwarding of datagrams received by — but not addressed to — this entity, according to the *ipForwarding*. IP gateways forward datagrams; IP hosts do not (except those source-routed via the host). For some managed nodes, this object may take on only a subset of the values possible. It is appropriate for an agent to return a ‘badValue’ response if a management station attempts to change this object to an inappropriate value.

The IP Group window displays the following statistics:

Received Datagrams

Total

The total number of input datagrams received from interfaces, including those received in error, according to *ipInReceives*.

Header Errors

The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc. This field displays *ipInHdrErrors.*

Address Errors

The number of input datagrams discarded because the IP address in their IP header’s destination field was not a valid address to be received at this entity. This count includes invalid addresses (e.g., 0.0.0.0) and addresses of unsupported Classes (e.g., Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address. This field displays the *ipInAddrErrors*.

Forwarded

The number of received datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets which were Source-Routed successfully via this entity, and the Source-Route option processing was successful. This field displays the *ipForwDatagrams.*

Unknown Protocol

The number of locally-addressed datagrams received successfully but discarded because of an unknown or unsupported protocol. This field displays the *ipInUnknownProtos*.

Discarded

The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (e.g., for lack of buffer space). This counter does not include any datagrams discarded while awaiting reassembly. This field displays the *ipInDiscards*.

Delivered

The total number of input IP datagrams successfully delivered to IP user-protocols (including ICMP), according to the *ipInDelivers*.

Transmitted Datagrams

Total

The total number of input datagrams successfully delivered to IP user-protocols (including ICMP), according to the *ipOutRequests*.

Discarded

The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (e.g., for lack of buffer space). This counter would include datagrams counted in *ipForwDatagrams* if any such packets met this (discretionary) discard criterion. This field displays the *ipOutDiscards.*

This counter indicates that the device is tossing away valid datagrams, indicating that the destination network is seriously overloaded, or that the device itself is experiencing problems (evidenced by the failing read-write buffer). If the device discards a datagram, it occurs after the device increments the Fwd Datagrams counter and passes the datagram to the transmit buffer.

No Route

The number of IP datagrams discarded because no route could be found to transmit them to their destination. This counter includes packets counted in *ipForwDatagrams* which meet this 'no-route' criterion, and any datagrams a host cannot route because all of its default gateways are down. This field displays the *ipOutNoRoutes*.

Datagram Fragmentation

Datagrams Fragmented

The number of IP datagrams that have been successfully fragmented at this entity, according to the *ipFragOKs*. A station fragments a datagram if the datagram is too large to fit within a physical frame.

Discarded

The number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be (e.g., because their Don't Fragment flag was set). This field displays the *ipFragFails*.

Fragments Created

The number of IP datagram fragments that have been generated as a result of fragmentation at this entity, according to the *ipFragCreate*.

Datagram Reassembly

Fragments Recvd

The number of IP fragments received which needed to be reassembled at this entity, according to the *ipReasmReqds*.

Datagrams Reassembled

The number of IP datagrams successfully reassembled, according to the *ipReasmOKs*. If a datagram is fragmented for transmission, the receiving station is responsible for reassembling the fragments. If the receiving station receives all fragments within the time period specified by the reassembly timer, it increments the Reasm OKs timer.

Reassembly Failures

The number of failures detected by the IP reassembly algorithm. Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received. This field displays the *ipReasmFails*.

Reassembly TimeOut

The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity, according to the *ipReasmTimeout*. IP attempts to encapsulate each datagram in a single physical frame. If it cannot do so, it fragments the datagram into multiple physical frames, The receiving station starts a reassembly timer when it receives the first fragment. If the timer expires before all fragments arrive, the device discards the fragments already received. The reassembly timer is a read-only attribute.

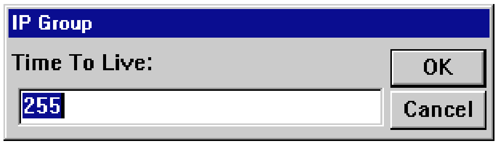
Setting the Time To Live Option

When a device transmits an IP datagram, it sets the amount of time, in seconds, the datagram is allowed to exist, by setting the Time-To-Live (TTL) field located in the datagram's header. This eliminates the possibility that a datagram could travel around a network forever. If the TTL timer expires before the datagram reaches its destination, the datagram is discarded and an error message is returned to the original sending device.

Each gateway along the datagram's path from source to destination decrements the TTL field by 1 when it processes the datagram's header field. The gateway also records the local time of datagram arrival and decrements the TTL timer by the number of seconds the datagram remained in the gateway awaiting service.

To set the Time To Live Option:

1. Click on the **I-bar cursor** (I) to the right of the **Time To Live** text box. The IP Group Time To Live text box, Figure 5-2, opens.



IP Group

Time To Live: 255

Figure 5-2. Time To Live Text Box

2. Enter the new default Time To Live (in seconds) in the text box. The allowable time values are 0 to 255.
3. Click **OK**.

The new default Time To Live displays in the text box. This indicates the number of seconds a datagram can continue to exist on the network. Any datagram that exceeds this limit will be discarded.

Chapter 6

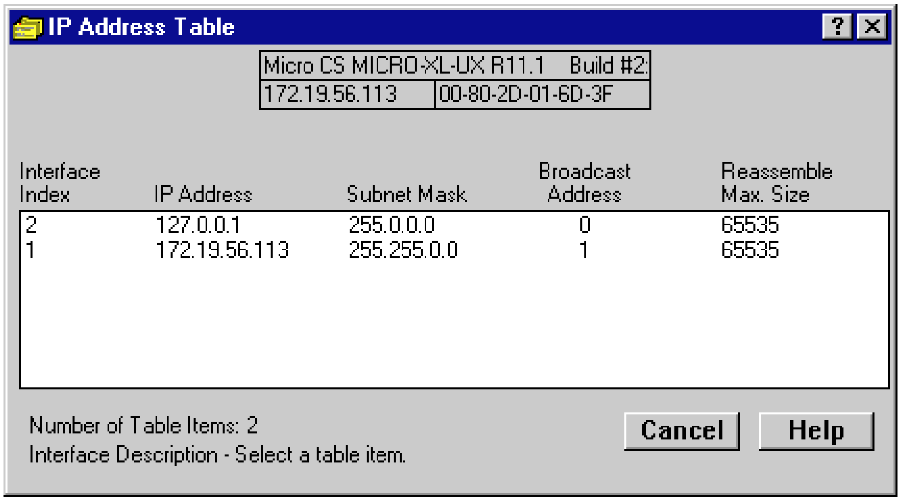
Viewing the IP Address Table

The IP Address Table window

The IP Address Table displays the IP Addresses and the subnet masks for each of the device’s interfaces. In addition, you can see whether network broadcasts will be sent with 1s or 0s in the host portion of the IP Address, and the maximum size fragment that can be reassembled.

To open the IP Address Table window from the System Group window:

1. Click on the **Other Groups** window. The Other Groups drop-down menu displays.
2. Click on **IP Address Table**. The IP Address Table window, Figure 6-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 00-80-2D-01-6D-3F

Interface Index	IP Address	Subnet Mask	Broadcast Address	Reassemble Max. Size
2	127.0.0.1	255.0.0.0	0	65535
1	172.19.56.113	255.255.0.0	1	65535

Number of Table Items: 2
Interface Description - Select a table item.

Figure 6-1. IP Address Table Window

The display panel of the IP Address Table window contains address information for each entry in the table. If there are more entries in the IP Address Table than can fit in the display panel, scroll bars displays so that you can view the remaining entries in the table.

Interface Index

The number of each interface on which this system can send and receive IP datagrams.

IP Address

The addressing information for one of this entity's IP addresses, according to the *ipAddrEntry*. A device with multiple interfaces, such as a bridge, can have multiple IP addresses.

Subnet Mask

The subnet mask associated with the IP address of this entry, according to the *ipAdEntNetMask*. The value of the mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0. A subnet mask identifies the network and host portion of a device's IP address. Octets in a dotted decimal notation subnet mask set to 255 indicate a network identifier. You set a device's subnet mask in the IP Routing Table.

Broadcast Address

The value of the least-significant bit in the IP broadcast address used for sending datagrams in the (logical) interface associated with the IP address of this entry, according to the *ipAdEntBcastAddr*. For example, when the Internet standard all-ones broadcast address is used, the value will be 1. This value applies to both the subnet and network broadcast addresses used by the entity on this (logical) interface.

A broadcast address has a hostid (the portion of the IP address that identifies the host) with all bits set to 1 or 0. This field displays whether all 1s or 0s will be used to address IP packets that are sent as network broadcasts. A broadcast reaches all hosts on the network.

Reassemble Max Size

The size of the largest IP datagram which this entity can reassemble from incoming IP fragmented datagrams received on this interface, according to the *ipAdEntReasmMaxSize*. The maximum size of a complete IP datagram is 65,535 bits.

Fields in the lower left section display the following information:

Number of Table Items

The number of IP address entries in the IP Address Table.

Interface Description

The Interface Description (*ifDescription*) for the currently selected interface in the IP address panel.

Chapter 7

Using the IP Routing Table Window

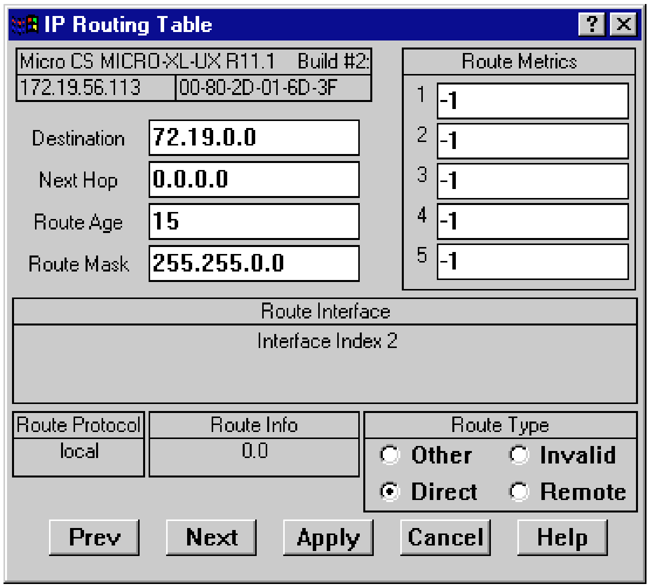
IP Routing Table window; modifying the routing information;

The IP Routing Table provides a way for devices to exchange data. Your local IP device must determine the next “hop” or stop on the data route. If the destination is on the same IP network, then the next hop is the destination IP address. Otherwise, the next stop is a router (gateway) on the same IP network as the local device. The router is determined to be “closer” to the destination device.

The IP Routing Table window lets you view and modify routing information for each interface.

To open the IP Routing Table window from the System Group window:

1. Click the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click on **IP Routing Table**. The IP Routing Table window, Figure 7-1, opens.



IP Routing Table

Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 00-80-2D-01-6D-3F

Destination 72.19.0.0
Next Hop 0.0.0.0
Route Age 15
Route Mask 255.255.0.0

Route Metrics
1 -1
2 -1
3 -1
4 -1
5 -1

Route Interface
Interface Index 2

Route Protocol
local

Route Info
0.0

Route Type
○ Other ○ Invalid
● Direct ○ Remote

Figure 7-1. IP Routing Table Window

The IP Routing Table displays the following fields:

Destination

The destination IP address of this route, according to the *ipRouteDest*. An entry with a value of 0.0.0.0 is considered a default route. Multiple routes to a single destination can appear in the table, but access to such multiple entries is dependent on the table-access mechanisms defined by the network management protocol in use. A gateway determines the route in which to send an IP datagram by checking its IP Routing Table. Each entry in the table represents a different route to a gateway. The routing table points to gateways that can be reached across a single network.

Next Hop

The IP address of the next hop of this route, according to the *ipRouteNextHop*. In the case of a route bound to an interface which is realized via a broadcast media, the value of this field is the agent’s IP address on that interface. If the datagram’s ultimate destination is on a directly connected network, the next hop IP address is the same as the datagram’s destination IP address. The next hop specifies a gateway that can route the datagram closer to its final destination.

Route Age

The number of seconds since this route was last updated or otherwise determined to be correct, according to the *ipRouteAge*. No semantics of ‘too old’ can be implied except through knowledge of the routing protocol by which the route was learned.

Route Mask

Indicates the mask to be logical-ANDed with the destination address before being compared to the value in the *ipRouteDest* field, according to the *ipRouteMask*. For those systems that do not support arbitrary subnet masks, an agent constructs the value of the *ipRouteMask* by determining whether the value of the corresponding *ipRouteDest* field belongs to a class-A, B, or C network, and then uses one of the following:

Mask	**Network**
255.0.0.0	class-A
255.255.0.0	class-B
255.255.255.0	class-C

If the value of the *ipRouteDest* is 0.0.0.0 (a default route), then the mask value is also 0.0.0.0. It should be noted that all IP routing subsystems implicitly use this mechanism. When a host or gateway receives an IP datagram, it must determine if the datagram's final destination is on the local network or on another network. The IP software does not need to examine the entire IP address to make this local/remote network decision; it only needs to compare the network portion of the received datagram's IP address with the network mask. If the datagram is destined for a host on the local net, the datagram is delivered directly; otherwise, it is sent to the IP address specified in the "next hop" field of the routing table.

Route Interface

The index value (*ipRouteIfIndex*) which uniquely identifies the local interface through which the next hop of this route should be reached. The interface identified by a particular value of this index is the same interface as identified by the same value of *ifIndex*.

Route Protocol

The routing mechanism via which this route was learned. Inclusion of values for gateway routing protocols is not intended to imply that hosts should support those protocols, according to the *ipRouteProto*.

- other (1)—none of the following
- local (2)—non-protocol information, e.g., manually configured entries
- netmgmt (3)—set via a network management protocol
- icmp (4)—obtained via ICMP, e.g., Redirect
- egp (5)
- ggp (6)
- hello (7)
- rip (8)
- is-is (9)
- es-is (10)
- ciscoIgrp (11)
- bbnSpflgp (12)
- ospf (13)
- bgp (14)

Route Info

A reference to MIB definitions specific to the particular routing protocol which is responsible for this route, as determined by the value specified in the route's *ipRouteProto* value. If this information is not present, its value should be set to the OBJECT IDENTIFIER {0,0}, which is a syntactically valid object identifier, and any conformant implementation of ASN.1 and BER must be able to generate and recognize this value. This field displays the *ipRouteInfo*.

Route Metrics

Displays the Routing Metrics for the route. Metrics may be Primary or Alternate as explained below:

Route Metric 1 — The primary routing metric for this route, according to the *ipRouteMetric1*. The semantics of this metric are determined by the routing-protocol type specified in the route's *ipRouteProto* value. If this metric is not used, its value should be set to -1.

Route Metrics 2-5 — An alternate routing metric for this route, according to the *ipRouteMetric2*, *ipRouteMetric3*, *ipRouteMetric4*, and *ipRouteMetric5* (the fifth route metric is available only for devices supporting MIB-II). The semantics of this metric are determined by the routing-protocol type specified in the route's *ipRouteProto* value. If this metric is not used, the value should be set to -1.

Route Type

The type of route, according to the *ipRouteType*. To change the Route Type, click on the appropriate option button:

- Other (1)None of the following.
- Invalid (2)An invalidated route.
- Direct (3)Route to directly connected (sub)network.
- Indirect (4)Route to a non-local host / network / subnetwork.

The values direct (3) and indirect (4) refer to the notion of direct and indirect routing in the IP architecture. Setting this object to the value of invalid (2) has the effect of invalidating the corresponding entry in the *ipRouteTable* object. It effectively disassociates the destination identified with said entry from the route identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive tabular information from agents that correspond to entries not currently in use. Proper interpretation of such entries requires examination of the relevant *ipRouteType* object.

NOTE

Fields not supported by the device's firmware will display a value of "Not avail in device".

Modifying Entries in the IP Routing Table

1. Click in the **Destination** field, enter the desired destination IP address.
2. Click in the **Next Hop** field, enter the IP address that you want to specify as the next hop of the route.
3. Click in the **Route Metrics** field(s), enter the desired metric value(s).
4. Click the desired option in the **Route Type** section.
5. Click **Apply** to accept the changes, or **Cancel** to exit the IP Routing Table window without saving changes.

NOTE

*The IP Routing Table window allows you to scroll through each entry in the table by using the **Prev** and **Next** buttons at the bottom of the window. As you click on **Prev** and **Next** to view each entry of the routing table, you can view the interface number associated with that route entry in the Route Interface list box in the middle of the window. When you get to the first or last entry, the **Prev** or **Next** button will be grayed-out, respectively. If you have made a change to a route entry, and then click on **Prev, Next,** a message will appear asking if you want to set the device with those changes. Click* **Yes** *to effect the changes or* **No** *to disallow any changes that have been made.*

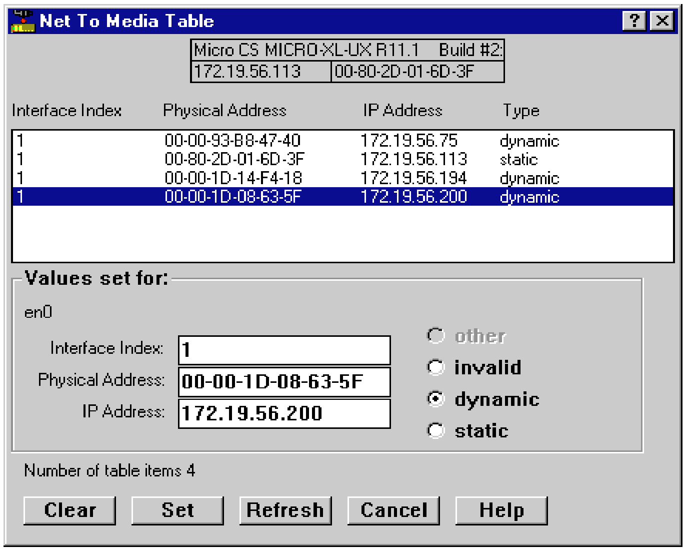
Using the Net to Media Table

The Net To Media Table window; modifying an entry

The Net to Media Table is used by MIB-II devices to map IP addresses to physical addresses when transmitting an IP datagram for devices on each network segment directly connected to the monitored device. The table includes the media type for each port interface, as well as the map type through which the table entry is obtained. MIB-I devices do not support the Net to Media Table.

To open the Net to Media Table window from the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click **NetToMedia Table**. The Net to Media Table window, Figure 8-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 | 00-80-2D-01-6D-3F

Interface Index	Physical Address	IP Address	Type
1	00-00-93-B8-47-40	172.19.56.75	dynamic
1	00-80-2D-01-6D-3F	172.19.56.113	static
1	00-00-1D-14-F4-18	172.19.56.194	dynamic
1	00-00-1D-08-63-5F	172.19.56.200	dynamic

Values set for:

en0

Interface Index: 1

Physical Address: 00-00-1D-08-63-5F

IP Address: 172.19.56.200

○ other
○ invalid
● dynamic
○ static

Number of table items 4

Figure 8-1. Net to Media Table Window

The display panel (top section) of the Net to Media Table displays address information for the associated interface. The **Values set for** section lets you modify entries in the display panel and make static entries to the ARP cache.

Interface Index

The interface on which this entry's equivalence is effective, according to the *ipNetToMediaIfIndex*. The interface identified by a particular value of this index is the same interface as identified by the same value of *ifIndex*.

Physical Address

The physical address, according to the *ipNetToMediaPhysAddress.* You can edit the physical address; however, changing a physical address in the Net to Media table does not change the device's physical address. It lets you edit the monitored device's knowledge of the relationship between a physical and an IP address.

IP Address

IP Address corresponding to the media-'physical' address, according to the *ipNetToMediaNetAddress*.

Mapping Type

The type of mapping, according to the *ipNetToMediaType*.

other (1)	none of the following.
invalid (2)	invalidated mapping; the address is present but the entry cannot be used.
dynamic (3)	address mapping is learned through ARP broadcasts.
static (4)	an entry has been manually added to the permanent database.

Setting this object to the value of invalid (2) has the effect of invalidating the corresponding entry in the *ipNetToMediaTable.* It effectively disassociates the interface identified with an entry from the mapping identified with that entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Management stations must be prepared to receive tabular information from agents that correspond to entries not currently in use. Proper interpretation of such entries requires examination of the relevant *ipNetToMediaType* object.

Editing the Net to Media Table

You can add new entries to and modify existing entries in the Net to Media Table.

Modifying Entries in the Net To Media Table

1. Click on an entry in the Net To Media Table. That entry's corresponding values for its Port Number, Physical Address, IP address, and Mapping Type, displays in the **Values set for** area.

2. Enter the desired changes in the **Physical Addr** field within the **Values set for** area.

3. Click on the option button corresponding to the way you want that entry mapped into the database (**other**, **invalid**, **dynamic**, or **static**). Selecting **invalid** as the mapping type disables the selected translation entry.

4. Click **Set**. Status information displays above the command buttons and a confirmation window opens; if the set succeeded, the changes displays in the list.

NOTE

When an entry is highlighted the interface description is displayed in the ***Values set for*** *section of the window, (e.g., Ctron SEHI EnetPort).*

Adding Entries to the Net to Media Table

You can make static entries to the ARP cache; static entries remain in the ARP cache until you remove them.

1. Click **Clear**. This allows you to enter values in the **Values set for** section.

2. Enter the port number, physical address, and IP address in the appropriate fields.

3. Click on the option button corresponding to the way you want that entry mapped into the database (**other**, **invalid**, **dynamic**, or **static**).

4. Click **Set**. Status information displays above the command buttons and a confirmation window opens; if the set succeeded, the new entry displays in the list.

NOTE

*If the Physical Address is entered in an incorrect format, an “****Invalid Ethernet Address****” message opens. Enter the address in the correct XX-XX-XX-XX-XX-XX hexadecimal format. If the IP Address is entered in an incorrect format, an “****Invalid IP Address****” message opens. Enter the address in the correct XXX-XXX-XXX-XXX format.*

Chapter 9

Viewing ICMP Group Statistics

The ICMP Group window

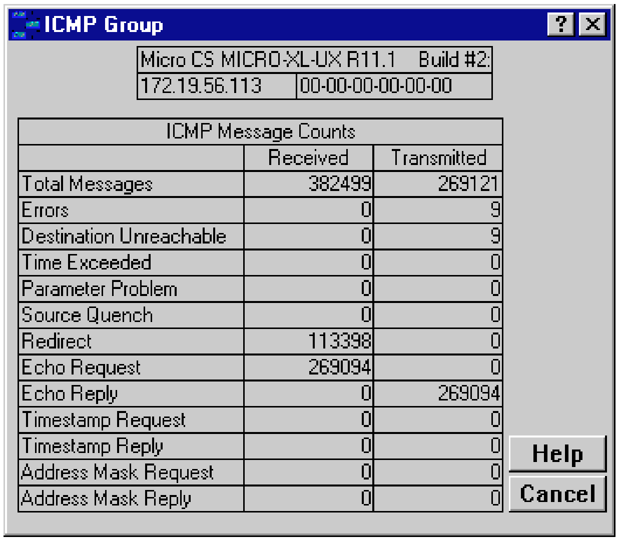
ICMP (Internet Control Message Protocol) is the Internet Protocol mechanism used by network devices to determine if a destination is reachable and to notify other devices about delivery problems. Using PING (Packet Internet Groper), an ICMP echo request packet is sent to an IP address and awaits a reply. This provides a means to test the availability of devices and routes on the network (from the local network device to a remote network device).

The ICMP Group window displays statistics for the ICMP datagram traffic transmitted and received by the device, which provides information on how your device is performing at the Internet layer.

To open the ICMP Group window from the System Group window:

1. Click on the **Other Groups** button. The Other Groups drop-down menu displays.

2. Click on **ICMP Group**. The ICMP Group window, Figure 9-1, opens.



Micro CS MICRO-XL-UX R11.1 Build #2:	
172.19.56.113	00-00-00-00-00-00

ICMP Message Counts		
	Received	Transmitted
Total Messages	382499	269121
Errors	0	9
Destination Unreachable	0	9
Time Exceeded	0	0
Parameter Problem	0	0
Source Quench	0	0
Redirect	113398	0
Echo Request	269094	0
Echo Reply	0	269094
Timestamp Request	0	0
Timestamp Reply	0	0
Address Mask Request	0	0
Address Mask Reply	0	0

Figure 9-1. ICMP Group Window

The ICMP Group window displays the following message statistics:

ICMP Received Message Statistics

Total Messages

The total number of ICMP messages which the entity received, according to the *icmpInMsgs*. This counter includes all those counted by *icmpInErrors*.

Errors

The number of ICMP messages which the entity received but determined as having ICMP-specific errors (bad ICMP checksums, bad length, etc.), according to the *icmpInErrors*.

Destination Unreachable

The number of ICMP Destination Unreachable messages received, according to the *icmpInDestUnreachs*. A gateway issues a destination unreachable message when it cannot deliver a datagram due to one of the following causes:

- network, host, protocol, or port was unreachable
- fragmentation was necessary but disallowed by the “don’t fragment” bit
- source route failed
- destination network or host unknown
- source host isolated
- communication with destination network or host administratively prohibited
- network or host unreachable for type of service

Time Exceeded

The number of ICMP Time Exceeded messages received, according to the *icmpInTimeExcds*. When a device discards a datagram because the time-to-live counter (hop count) reached zero, or because the reassembly counter expired while waiting for fragments, a router sends a time exceeded message to the station that transmitted the original datagram. A time exceeded message can indicate an excessively long route from source to destination, or it could indicate a circular route due to errors in the routing tables. For fragmented packets, the receiving station starts its reassembly timer when it receives the first fragment of a fragmented datagram. If the timer expires before all fragments are received, the station discards the fragments it has already received, and transmits a time exceeded message.

Parameter Problem

The number of ICMP Parameter Problem messages received, according to the *icmpInParmProbs*. A parameter problem message indicates that a datagram was discarded due to a problem not covered by any of the previous messages.

Source Quench

The number of ICMP Source Quench messages received, according to the *icmpInSrcQuenchs*. A router issues a source quench message when network traffic overwhelms the router’s buffering capability. A source quench message instructs a host to slow its current rate of datagram transmission.

Redirect

The number of ICMP Redirect messages received, according to the *icmpInRedirects*. When a host transmits, it uses minimal routing information and it learns new routes from routers. A router that detects a host using an inefficient route sends a redirect message that contains new routing information.

Echo Request

The number of ICMP Echo (request) messages received, according to the *icmpInEchos.* An echo request tests connectivity between two network devices.

Echo Reply

The number of ICMP Echo Reply messages received, according to the *icmpInEchoReps*. When a device receives an echo request, it responds by issuing an echo reply.

Timestamp Request

The number of ICMP Timestamp Request messages received, according to the *icmpInTimeStamps*.

Timestamp Reply

The number of ICMP Timestamp Reply messages received, according to the *icmpInTimeStampReps*. To synchronize system clocks, a machine can issue a timestamp request to another machine. The destination machine then issues a timestamp reply message that includes the system time.

Address Mask Request

The number of ICMP Address Mask Request Messages received, according to the *icmpInAddrMasks*.

Address Mask Reply

The number of ICMP Address Mask Reply messages received, according to the *icmpInAddrMaskReps*. To determine the network subnet mask, a machine can issue an address mask request, either targeted to a specific address or a broadcast to the entire network. A responding machine includes the network subnet mask in an address mask reply.

ICMP Transmitted Message Statistics

Total Messages

The total number of ICMP messages which this entity attempted to send, including all those counted by *icmpOutErrors*. This field displays *icmpOutMsgs*.

Errors

The number of ICMP messages which this entity did not send due to problems discovered within ICMP such as lack of buffers, according to the *icmpOutErrors*. OutErrors indicates the number of ICMP messages that were queued for transmission and then not transmitted due to problems discovered by ICMP. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of error which contribute to this counter’s value.

Destination Unreachable

The number of ICMP Destination Unreachable messages sent, according to the *icmpOutDestUnreachs*. A gateway issues a destination unreachable message when it cannot deliver a datagram due to one of the following causes:

- network, host, protocol, or port was unreachable
- fragmentation was necessary but disallowed by the “don’t fragment” bit
- source route failed
- destination network or host unknown
- source host isolated
- communication with destination network or host administratively prohibited
- network or host unreachable for type of service

Time Exceeded

The number of ICMP Time Exceeded messages sent, according to the *icmpOutTimeExcds*. When a device discards a datagram because the time-to-live counter (hop count) reached zero, or because the reassembly counter expired while waiting for fragments, a router sends a time exceeded message to the station that transmitted the original datagram. A time exceeded message can indicate an excessively long route from source to destination, or a circular route due to errors in the routing tables. For fragmented packets, the receiving station starts its reassembly timer when it receives the first fragment of a fragmented datagram. If the timer expires before all fragments are received, the station discards the fragments it has already received, and transmits a time exceeded message.

Parameter Problem

The number of ICMP Parameter Problem messages sent, according to the *icmpOutParmProbs*. A parameter problem message indicates that a datagram was discarded due to a problem not covered by any of the previous messages.

Source Quench

The number of ICMP Source Quench messages sent, according to the *icmpOutSrcQuenchs*. A router issues a source quench message when network traffic overwhelms the router's buffering capability. A source quench message instructs a host to slow its current rate of datagram transmission.

Redirect

The number of ICMP Redirect messages sent, according to the *icmpOutRedirects*. When a host transmits, it uses minimal routing information and it learns new routes from routers. A router that detects a host using an inefficient route sends a redirect message that contains new routing information.

Echo Request

The number of times an ICMP Echo (request) messages is sent, according to the *icmpOutEchos*. An echo request tests the connectivity between two network devices.

Echo Reply

The number of ICMP Echo Reply messages sent, according to the *icmpOutEchoReps*. When a device receives an echo request, it responds by issuing an echo reply.

Timestamp Request

The number of ICMP Timestamp Request messages sent, according to the *icmpOutTimeStamps*.

Timestamp Reply

The number of ICMP Timestamp Reply messages sent, according to the *icmpOutTimeStampReps*. To synchronize system clocks, a machine can issue a timestamp request to another machine. The destination machine then issues a timestamp reply message that includes the system time.

Address Mask Request

The number of ICMP Address Mask Request Messages sent, according to the *icmpOutAddrMasks*.

Address Mask Reply

The number of ICMP Address Mask Reply messages sent, according to the *icmpOutAddrMaskReps*. To determine the network subnet mask, a device can issue an address mask request, either targeted to a specific address or a broadcast to the entire network. A responding device includes the network subnet mask in an address mask reply.

Chapter 10

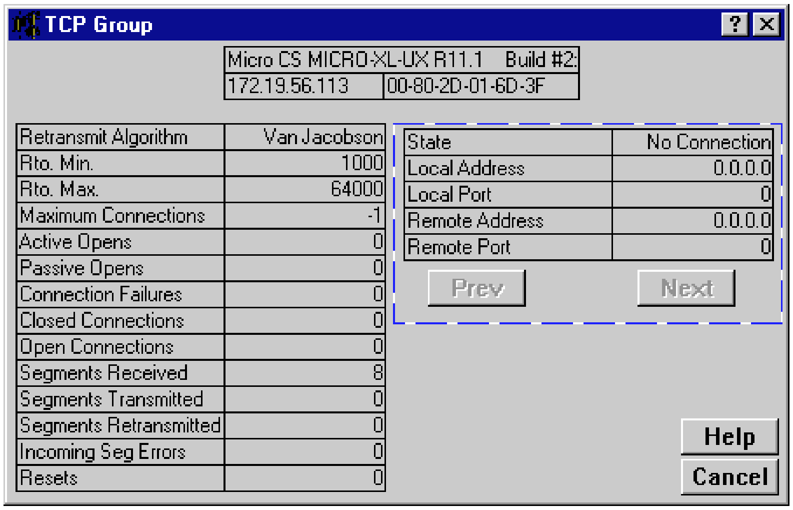
Viewing TCP Group Information

The TCP Group window

The Transmission Control Protocol (TCP) is often called reliable stream transport service because it is based on a connection between two nodes. Like IP, TCP's purpose is to transfer data between applications. TCP segments, the basic unit of data transfer within TCP, are carried within IP datagrams; usually, each TCP segment travels across the internet within a single IP datagram. Unlike IP, TCP ensures that the data arrives at its destination. If a delivery problem occurs, the sending application receives notification and can take appropriate action. This reliability is possible because TCP creates a two-way communication stream between the sending and receiving station. The connection is full-duplex—data flows both directions simultaneously.

To open the TCP Group window:

1. Click the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click **TCP Group**. The TCP Group window, Figure 10-1, opens.



Micro CS MICRO-XL-UX R11.1	Build #2:
172.19.56.113	00-80-2D-01-6D-3F

Retransmit Algorithm	Van Jacobson
Rto. Min.	1000
Rto. Max.	64000
Maximum Connections	-1
Active Opens	0
Passive Opens	0
Connection Failures	0
Closed Connections	0
Open Connections	0
Segments Received	8
Segments Transmitted	0
Segments Retransmitted	0
Incoming Seg Errors	0
Resets	0

State	No Connection
Local Address	0.0.0.0
Local Port	0
Remote Address	0.0.0.0
Remote Port	0

Figure 10-1. TCP Group Window

The left portion of the TCP Group window displays statistics about TCP circuits. The right portion shows the current active connections.

TCP Statistics

Retransmit Algorithm

The algorithm used to determine the timeout value for retransmitting unacknowledged octets, according to the *tcpRtoAlgorithm*.

- other (1)—none of the following
- constant (2)—a constant rto
- rsre (3)—MIL-STD-1778, Appendix B
- vanj—Van Jacobson’s algorithm

Every time TCP sends a segment, it starts a timer and waits for an acknowledgement that the receiving station received the segment. If the timer expires before the acknowledgment arrives, the sending station assumes that the segment was lost or corrupted and retransmits the segment. To function in an internet environment, TCP retransmission algorithms are adaptive, that is, each segment received and acknowledged adds to TCP’s understanding of the time required for a datagram to travel between the two nodes.

Rto. Min. (Retransmit time out Minimum)

The minimum value permitted by a TCP implementation for the retransmission timeout (measured in milliseconds) according to the *tcpRtoMin*. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre (3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.

Rto. Max. (Retransmit time out Maximum)

The maximum value permitted by a TCP implementation for the retransmission timeout (measured in milliseconds) according to the *tcpRtoMax*. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre (3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.

Maximum Connections

The limit on the total number of TCP connections the entity can support, according to the *tcpMaxConn*. In devices where the maximum number of connections is dynamic, this object should contain the value -1.

Active Opens

The number of times the TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state, according to the *tcpActiveOpens.* Before TCP can begin transmitting data, applications at both the sending and receiving applications must agree to form a connection. To form the connection, the sending application asks TCP for a passive open, which means that it will accept incoming connections. TCP assigns a port number. The application at the other end then must contact its operating system (TCP) and request for an active open, which specifies the IP addresses and port number of the passive open. Once the two machines agree to set up communication, the first segment sent by the TCP protocol is the SYNchronizing segment, which synchronizes the two ends of the connection.

Passive Opens

The number of times the TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state, according to the *tcpPassiveOpens*. Before TCP can begin transmitting data, applications at both the sending and receiving applications must agree to form a connection. To form the connection, the sending application asks TCP for a passive open, which means that it will accept incoming connections. TCP assigns a port number. The application at the other end then must contact its operating system (TCP) and request an active open, which specifies the IP address and port number of the passive open. Once the two machines agree to set up communication, the first segment sent by the TCP protocol is the SYNchronizing segment, which synchronizes the two ends of the connection. The station that receives the SYN-SENT message replies with a SYN-RCVD message.

Connection Failures

The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state and the number of times the TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state. This field displays the *tcpAttemptFails.*

Closed Connections

The number of times the TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state, according to the *tcpEstabResets*.

Open Connections

The number of TCP connections in which the current state is either ESTABLISHED or CLOSE-WAIT, according to the *tcpCurrEstab*.

Segments Received

The total number of segments received, including those received in error, according to the *tcpInSegs*. This count includes segments received on currently established connections.

Segments Transmitted

The total number of segments sent, including those on current connections but excluding those containing only retransmitted octets, according to the *tcpOutSegs*.

Segments Retransmitted

The total number of segments retransmitted—that is, the number of TCP segments transmitted containing one or more previously transmitted octets, according to the *tcpRetransSegs*.

NOTE

The Incoming Seg Errors and Resets fields are only supported by devices using MIB-II as a management database.

Incoming Seg Errors

The total number of segments received in error (e.g., bad TCP checksums), according to the *tcpInErrors*. If this counter shows a steady increase, it may indicate that received segments have been encapsulated incorrectly.

Resets

The number of TCP segments sent containing the RST flag, according to the *tcpOutRsts*. The number of times TCP tried to reset a connection due to a faulty connection, a user request, or a lack of resources.

Active Connections Table

The following information is displayed for each Active Connection in the TCP Group window. If there is no TCP connection at the device, “No Connection” displays in the connection **State** field.

State

The state of this TCP connection, according to the *tcpConnState*. Possible states are:

- closed (1)
- listen (2)
- synSent (3)
- synReceived (4)
- established (5)
- finWait1 (6)
- finWait2 (7)
- closeWait (8)
- lastAck (9)
- closing (10)
- timeWait (11)
- deleteTCB (12)

The only value which may be set by a management station is deleteTCB (12). Accordingly, it is appropriate for an agent to return a ‘badValue’ response if a management station attempts to set this object to any other value. If a management station sets this object to the value deleteTCB (12), then this has the effect of deleting the TCB (as defined in RFC 793) of the corresponding connection on the managed node, resulting in immediate termination of the connection. As an implementation-specific option, a RST segment may be sent from the managed node to the other TCP endpoint (note however that RST segments are not sent reliably). During the course of a TCP communication session, the connection’s State will change depending on the current activity. From a management station, a manager can set the state to deleteTCB, which severs the connection.

Local Address

The local IP address for this TCP connection, according to the *tcpConnLocalAddress*. In the case of a connection in the listen state which is willing to accept connections for any IP interface associated with the node, the value 0.0.0.0 is used.

Local Port

The local port number for this TCP connection, according to the *tcpConnLocalPort*.

Remote Address

The remote IP Address for this TCP connection, according to the *tcpConnRemAddress*.

Remote Port

The remote port number for this TCP connection, according to the *tcpConnRemPort*. Most TCP applications use a set of well-known ports. Well-known ports are always 256 or lower. A few examples of well-known port numbers are 21 for FTP, 23 for Telnet, and 53 for domain name server. Other port numbers are available for assignment as needed.

TIP *The **Prev** and **Next** buttons let you scroll through the connections on your device, and review their state. As you scroll through the connection information, the chart's field values change in relation to the port you have selected. If either the **Prev** and **Next** button is grayed out, you are at the beginning or end of the connection table.*

Chapter 11

Viewing UDP Group Information

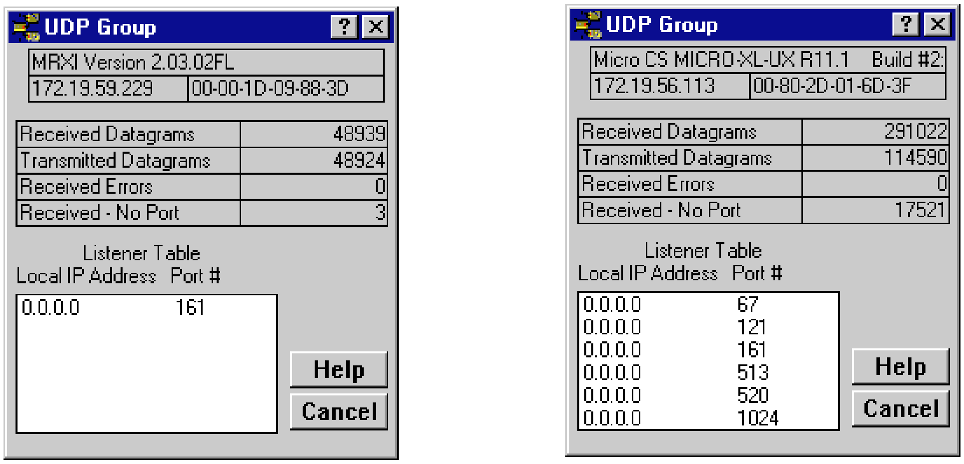
The UDP Group window

The User Datagram Protocol (UDP) is the piece of the TCP / IP protocol suite that deals with getting a datagram from an application running on one host to an application running on a different host. UDP is able to choose the correct process on a host by delivering the datagram to a specific port. A port is nothing more than a queue, assigned by the operating system and used by a specific process to send and receive datagrams.

UDP uses IP as the underlying transport mechanism; as such, UDP provides unreliable connectionless delivery service. Since the protocol does not employ any type of acknowledgment mechanism, the sending application is not notified of delivery problems (datagrams getting lost, duplicated, or arriving out of order).

To open the UDP Group window from the System Group window:

1. Click the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click on **UDP Group**. The UDP Group window, Figure 11-1, opens.



MRXI Version 2.03.02FL
172.19.59.229 | 00-00-1D-09-88-3D

Received Datagrams	48939
Transmitted Datagrams	48924
Received Errors	0
Received - No Port	3

Listener Table

Local IP Address	Port #
0.0.0.0	161

Micro CS MICRO-XL-UX R11.1 Build #2:
172.19.56.113 | 00-80-2D-01-6D-3F

Received Datagrams	291022
Transmitted Datagrams	114590
Received Errors	0
Received - No Port	17521

Listener Table

Local IP Address	Port #
0.0.0.0	67
0.0.0.0	121
0.0.0.0	161
0.0.0.0	513
0.0.0.0	520
0.0.0.0	1024

Figure 11-1. UDP Group Window—MIB I and MIB II

The UDP Group window displays statistics about UDP connections. The Listener Table (bottom portion) displays the current UDP connections (MIB II only).

UDP Group Statistics

Receive Datagrams

The total number of UDP datagrams delivered to UDP users, according to the *udpInDatagrams*. A UDP user is the protocol port assigned by the operating system to a particular application.

Transmitted Datagrams

The total number of UDP datagrams sent from this entity, according to the *udpOutDatagrams*.

Receive Errors

The number of receive UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port, according to the *udpInErrors*. One possible cause of Receive Errors is a full buffer. A protocol port is a buffered queue; if messages arrive faster than the application can process, the buffer fills up, which causes messages to be discarded and logged as Receive Errors. Other errors, such as bad checksum, indicate that the datagram was damaged in transit.

Received—No Port

The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port, according to the *udpNoPorts*.

UDP Listener Table

The UDP Listener Table, available for MIB-II devices, displays a list of the active UDP ports on the device.

Local IP Address

In the case of a UDP listener which is willing to accept datagrams for any IP interface associated with the node, the value 0.0.0.0 is used. This field displays the *udpLocalAddress*.

Port

The local port number for this UDP listener, according to the *udpLocalPort*

Chapter 12

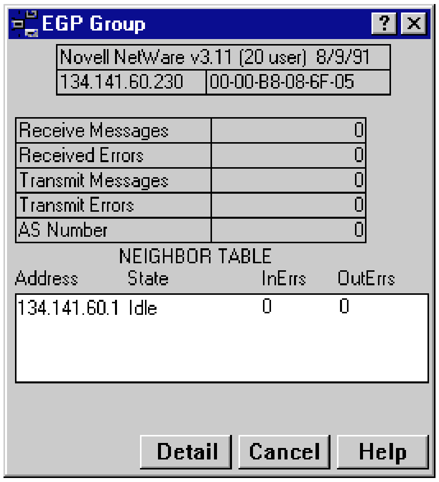
Viewing EGP Group Information

The EGP Group window; displaying the EGP Group Neighbor Table Detail window, using the Event Trigger button

The Exterior Gateway Protocol (EGP) controls how gateways on neighboring autonomous systems exchange routing information; it tells an IP network device about the reachability of other IP networks. It does not provide the entire route; but merely indicates the route a datagram would need to follow to reach a given network.

To open the EGP Group window from the System Group window:

1. Click the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click **EGP Group**. The EGP Group window, Figure 12-1, opens.



Novell NetWare v3.11 (20 user) 8/9/91
134.141.60.230 | 00-00-B8-08-6F-05

Receive Messages	0
Received Errors	0
Transmit Messages	0
Transmit Errors	0
AS Number	0

NEIGHBOR TABLE

Address	State	InErrs	OutErrs
134.141.60.1	Idle	0	0

Figure 12-1. EGP Group Window—MIB II

The EGP Group window displays the following statistics:

Receive Messages

The number of EGP messages received without errors, according to *egpInMsgs*.

Receive Errors

The number of EGP messages received that proved to be in error, according to *egpInErrors*.

Transmit Messages

The total number of locally generated EGP messages, according to *egpOutMsgs*.

Transmit Errors

The number of locally generated EGP messages not sent due to resource limitations within an EGP entity, according to *egpOutErrors*.

AS Number

The autonomous system number of this EGP entity, according to *egpAs*. Each autonomous system known to this device has a unique index number.

EGP Neighbor Table

The EGP Neighbor Table displays information about this device’s relationship with a particular EGP neighbor(s). An EGP neighbor is a gateway on a neighboring autonomous system.

Address

The IP address of the entry’s EGP neighbor, according to *egpNeighAddr*.

State
The EGP state of the local system with respect to this entry's EGP neighbor, according to *egpNeighState*. Each EGP state is represented by a value that is one greater than the numerical value associated with the EGP peer. Possible EGP states are:

- idle
- acquisition
- down
- up
- cease
- no neighbor

The following two fields are displayed for devices that firmware supports MIB-II:

InErrs
The number of EGP messages received from this EGP peer that proved to be in error (e.g., bad EGP checksum), according to *egpNeighInErrs*.

OutErrs
The number of locally generated EGP messages not sent to this EGP peer due to resource limitations within an EGP entity, according to *egpNeighOutErrs*.

Displaying the EGP Group Neighbor Table Detail Window

The EGP Group Neighbor Table Detail window, Figure 12-2, allows you to get more detailed EGP information for devices that support SNMP MIB II.

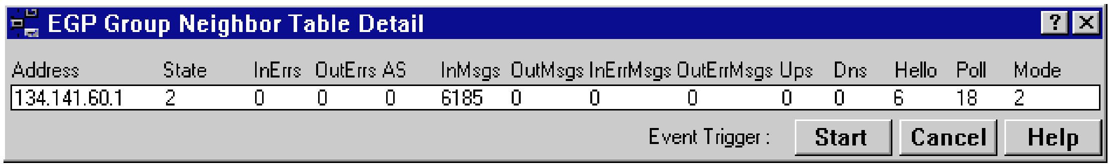
There are two ways to access the EGP Group Neighbor Table Detail window:

1. Double-click on an entry in the Neighbor Table of the EGP Group window.

   or

1. Click to highlight an entry and click the **Detail** button.

   The EGP Group Neighbor Table Detail window, as shown in Figure 12-2, opens.



Address	State	InErrs	OutErrs	AS	InMsgs	OutMsgs	InErrMsgs	OutErrMsgs	Ups	Dns	Hello	Poll	Mode
134.141.60.1	2	0	0	0	6185	0	0	0	0	0	6	18	2

Figure 12-2. EGP Group Neighbor Table Detail Window

The EGP Group Neighbor Table Detail window displays the following statistics:

Address

The IP address of the entry’s EGP neighbor, according to *egpNeighAddr*.

State

The EGP state of the local system with respect to this entry’s EGP neighbor, according to the *egpNeighState*. Each EGP state is represented by a value that is one greater than the numerical value associated with the EGP peer. Possible EGP states are:

- idle (1)
- acquisition (2)
- down (3)
- up (4)
- cease (5)
- no neighbor (6)

InErrs

The number of EGP messages received from this EGP peer that proved to be in error (e.g., bad EGP checksum), according to *egpNeighInErrs*.

OutErrs

The number of locally generated EGP messages not sent to this EGP peer due to resource limitations within an EGP entity, according to *egpNeighOutErrs*.

AS

The autonomous system of this EGP peer, according to *egpNeighAs*. Each autonomous system known to this entity has a unique index number. Zero should be specified if the autonomous system number of the neighbor is not yet known.

InMsgs

The number of EGP messages received from this EGP peer, according to *egpNeighInMsgs*.

OutMsgs

The number of locally generated EGP messages to this EGP peer, according to *egpNeighOutMsgs*.

Ups

The number of EGP state transitions to the UP state with this EGP peer, according to *egpNeighStateUps*.

Dns

The number of EGP state transitions from the UP state to any other state with this EGP peer, *egpNeighStateDowns*.

Hello

The interval between EGP Hello command retransmissions (in hundredths of a second), according to *egpNeighIntervalHello*. This represents the t1 timer as defined in RFC 904. The t1 timer controls Request (initiate communications with a neighbor), Hello (periodic reachability updates), and Cease (sever communications with a neighbor) transmissions.

Poll

The interval between EGP poll command retransmissions (in hundredths of a second), according to *egpNeighIntervalPoll*. This represents the t3 timer as defined in RFC 904. The t3 timer is an abort timer. It runs during all states except Idle. If the t3 timer reaches 0, a Stop event is declared and the EGP entity returns to the Idle state.

Mode

The polling mode of this EGP entity, according to *egpNeighMode*, either passive or active. Mode indicates the Hello Polling Mode. In the Active mode, the device acquires reachability information by transmitting Hello and Poll commands to neighbors. In the Passive mode, the device doesn’t transmit; it reads the status field of received Poll or Hello commands or Update responses.

Event Trigger

A control variable used to trigger operator-initiated Start and Stop events, according to *egpNeighEventTrigger*. When read, this variable always returns the most recent value that egpNeighEventTrigger was set to. If it has not been set since the last initialization of the network management subsystem on the node, it returns a value of ‘stop’. When set, this variable causes a Start or Stop event on the specified neighbor, as specified on pages 8-10 of RFC 904. Briefly, a Start event causes an Idle peer to begin neighbor acquisition and a non-Idle peer to reinitiate neighbor acquisition. A stop event causes a non-Idle peer to return to the Idle state until a Start event occurs, either via egpNeighEventTrigger or otherwise.

Setting the Event Trigger

The Event Trigger can start or stop communication with an EGP Neighbor. For example, if you have primary and secondary connections to an autonomous system, you could stop the process to one device and start the process to the other device, which would change the path of communications with that neighboring autonomous system.

To start and stop communication with an EGP Neighbor:

1. In the EGP Group Neighbor Table Detail window, highlight an entry in the table.
2. Click on the **Start/Stop** button.

This button always reflects the most recent command received. If this trigger has not been set since the last initialization of the network management subsystem on the node, the button will default to **Stop**.

Chapter 13

Viewing SNMP Group Information

The SNMP Group window; disabling and enabling authentication failure traps

The Simple Network Management Protocol (SNMP) facilitates communication between a management application, like NetSight Element Manager, and a network device, through the use of Protocol Data Units (PDUs). A network manager requests data by issuing a Get-Request or Get-Next Request PDU, or writes a new value into the device's MIB by issuing a Set-Request PDU. The agent responds to Gets by issuing a Get-Response PDU or sends asynchronous notification of unusual events to the manager by issuing a Trap PDU.

To open the SNMP Group window from the System Group window:

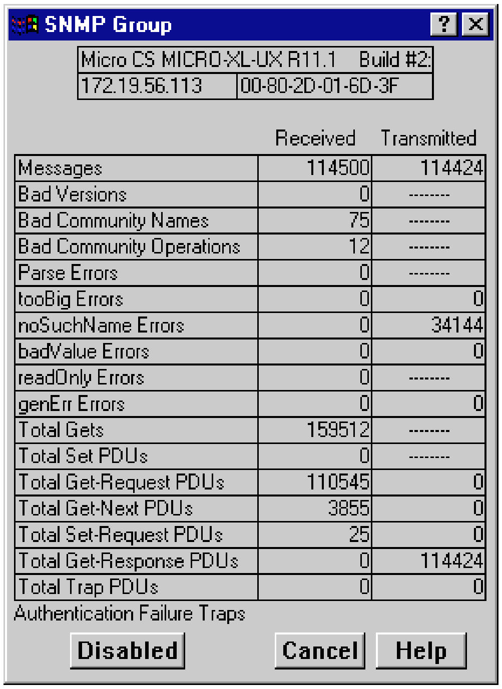
1. Click the **Other Groups** button. The Other Groups drop-down menu displays.
2. Click **SNMP Group**. The SNMP Group window, Figure 13-1, opens.

NOTE

This window displays only if your device's firmware supports MIB-II for Network Management of TCP/IP-based internets.

NOTE

In order for your device to issue any traps—and in order for your management workstation to receive those traps—your SNMP device's trap table must have been properly configured via Local Management or the Remote Administration Tools application; refer to the hardware documentation or the ***Remote Administration Tools User's Guide*** *for more information. In addition, refer to the* ***Alarm and Event Handling User's Guide*** *for more information on the alarm logging facility.*



Micro CS MICRO-XL-UX R11.1 Build #2:	
172.19.56.113	00-80-2D-01-6D-3F

	Received	Transmitted
Messages	114500	114424
Bad Versions	0	--------
Bad Community Names	75	--------
Bad Community Operations	12	--------
Parse Errors	0	--------
tooBig Errors	0	0
noSuchName Errors	0	34144
badValue Errors	0	0
readOnly Errors	0	--------
genErr Errors	0	0
Total Gets	159512	--------
Total Set PDUs	0	--------
Total Get-Request PDUs	110545	0
Total Get-Next PDUs	3855	0
Total Set-Request PDUs	25	0
Total Get-Response PDUs	0	114424
Total Trap PDUs	0	0

Authentication Failure Traps

Disabled

Figure 13-1. SNMP Group Window

The SNMP Group Window displays a summary of PDU activity, and lets you enable or disable the device’s ability to issue authentication failure traps.

SNMP Received Statistics

The fields described below represent counters which record various categories of received SNMP messages.

Messages

The total number of messages delivered to the SNMP entity from the transport service. If the device is a hub device, such as a repeater or a bridge, this number indicates the number of SNMP data requests (Get and Set operations). If the device is a management station, Packets Received (level of management traffic) also includes trap messages. This field displays *smnpInPkts.*

Bad Versions

The total number of SNMP messages which were delivered to the SNMP protocol entity and were for an unsupported SNMP version, according to the *snmpInBadVersions.* SNMP messages include a version number but, SNMP, unlike most protocols, does not try to resolve version differences. If an SNMP entity receives a message with an unknown version number, SNMP discards the message and increments the InBadVersions counter.

Bad Community Names

The total number of messages delivered to the SNMP protocol entity which used a SNMP community name not known to the entity, according to the *snmpInBadCommunityNames.* An SNMP Get or Set request must be accompanied by a valid community name.

Bad Community Operations

The total number of SNMP messages delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the message, according to the *snmpInBadCommunityUses.* The community name specified in the SNMP message did not have the necessary privileges to complete the operation. For example, you issued a Set-Request, but specified a community name that only granted read access.

Parse Errors

The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding received SNMP messages, according to the *snmpInBadCommunityUses.* ASN.1 is Abstract Syntax Notation One, the International Standards Organization (ISO) MIB object identification and naming convention. BER is Basic Encoding Rules, an algorithm that encodes an ASN.1 value into a form suitable for transmission. A parse error indicates that the received BER value, or the ASN.1 value encoded in the received BER, does not conform to the syntax rules. In other words, you got a good SNMP packet, but the data it contained was useless.

tooBig Errors

The total number of valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the error status field is ‘tooBig’, according to the *snmpInTooBigs*. A too Big error is often due to a Get-Next operation because the Get-Next operation can retrieve a large amount of data. It occurs when the SNMP agent could not fit the results of an operation into a single SNMP message.

noSuchName Errors

The total number of SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the error-status field is noSuchName, according to the *snmpInNoSuchNames.* A Set operation returned an error; the variable name specified in the Set did not exist according to the community profile (the combination of a community name’s access mode — read only or read / write — with the subset of MIB objects defined for the community name).

badValue Errors

The total number of SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the error-status field is badValue, according to the *snmpInBadValues.* An incoming Set operation specified an incorrect syntax or value.

readOnly Errors

The total number of valid SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the error-status field is ‘readOnly’. It should be noted that it is a protocol error to generate a SNMP PDU which contains the value ‘readOnly’ in the error-status field, as such this object is provided as a means of detecting incorrect implementation of the SNMP. This field displays the *snmpInReadOnlys.* A set operation tried to modify a variable that is not included in the SNMP community profile (the combination of a community name’s access mode — read only or read / write — with the subset of MIB objects (view) defined for the community name.

genErr Errors

The total number of SNMP PDUs which were delivered to the SNMP protocol entity and for which the value of the error-status field is genErr, according to the *snmpInGenErrs*. A genErr is a general or generic error — one that does not fit any of the four specific error types: tooBig, noSuchName, badValue, and readOnly.

Total Gets

The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as the result of receiving valid SNMP Get-Requests and Get-Next PDUs, according to *snmpInTotalReqVars*.

Total Set PDUs

The total number of MIB objects which have been altered successfully by the SNMP protocol entity as the result of receiving valid SNMP Set-Requests PDUs, according to *snmpInTotalSetVars*. This counter also includes valid Sets that fail. For example, if you tried to Set a new device Name, but included a non-ASCII character in the name, the Set would fail, and both the InSetRequests and OutBadValues counters would increment.

Total Get-Request PDUs

The total number of SNMP Get-Request PDUs which have been accepted and processed by the SNMP protocol entity, according to *snmpInGetRequests*. This counter includes successful Get operations and valid Get operations that fail.

Total Get-Next PDUs

The total number of SNMP Get-Next PDUs which have been accepted and processed by the SNMP protocol entity, according to *snmpInGetNexts*.

Total Set-Request PDUs

The total number of SNMP Set-Request PDUs which have been accepted and processed by the SNMP protocol entity, according to *snmpInSetRequests*. This counter includes successful Set operations and valid Set operations that fail.

Total Get-Response PDUs

The total number of SNMP Get-Response PDUs which have been accepted and processed by the SNMP protocol entity, according to *snmpInGetResponses*.

Total Trap PDUs

The total number of SNMP Trap PDUs which have been accepted and processed by the SNMP protocol entity, according to *snmpInTraps*. This counter represents traps received by a device. A device can not receive traps unless the sending device's community names table is set up so that traps are enabled and pointed toward the receiving station's IP address.

SNMP Transmit Statistics

The following SNMP group variables are counters which record various categories of transmitted SNMP messages.

Messages

The total number of SNMP messages which were passed from the SNMP protocol entity to the transport service, according to *snmpOutPkts.*

tooBig Errors

The total number of SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the error-status field is tooBig, according to *snmpOutTooBigs.* A tooBig error is often due to a Get-Next operation because the Get-Next can retrieve a large amount of data. It occurs when the SNMP agent could not fit the results of an operation into a single SNMP message.

noSuchName Errors

The total number of SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the error-status is noSuchName, according to the *snmpOutNoSuchNames*. The variable name specified in the Set did not exist according to the community profile. A community profile is the combination of a community name's access mode (read-only or read-write) with the subset of MIB objects (view) defined for the community name.

badValue Errors

The total number of SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the error-status field is badValue, according to the *snmpOutNoSuchNames.* When an incoming Set operation specifies an incorrect syntax or value, the resulting Get-Response message contains the 'badValue' error status.

genErr Errors

The total number of SNMP PDUs which were generated by the SNMP protocol entity and for which the value of the error-status is genErr, according to the *snmpOutGenErrs*. SNMP tracks messages sent with an error that does not fit any of the four specific error types: tooBig, noSuchName, badValue, and readOnly.

Total Get-Request PDUs

The total number of SNMP Get-Request PDUs which have been generated by the SNMP protocol entity, according to the *snmpOutGetRequests.*

Total Get-Next PDUs

The total number of SNMP Get-Next PDUs which have been generated by the SNMP protocol entity, according to the *snmpOutGetNexts.*

Total Set-Request PDUs

The total number of SNMP Set-Request PDUs which have been generated by the SNMP protocol entity, according to the *snmpOutSetRequests.*

Total Get-Response PDUs

The total number of SNMP Get-Response PDUs which have been generated by the SNMP protocol entity, according to the *snmpOutGetResponses.* A Get-Response is the SNMP message transmitted by an SNMP agent in response to a manager's Get-Request or Get-Next-Request.

Total Trap PDUs

The total number of SNMP Trap PDUs which have been generated by the SNMP protocol entity, according to the *snmpOutTraps.*

Disabling/Enabling Authentication Failure Traps

An SNMP entity has the ability to issue an Authentication Failure Trap when another SNMP entity attempts to perform an administrative action without the proper community name authorization—for example, when an SNMP network manager attempts a SET without a valid community name. The Authentication Failure Traps **Enabled/Disabled** button indicates whether the device is currently configured to issue these traps, and will let you change the device's configuration with respect to issuing these traps. If you toggle this button, your new selection will override the current configuration for the device, and it will remain in the device's nonvolatile memory so that the setting remains constant between reinitializations of network management systems.

The current trap setting at the device is displayed on the button as follows: **Enabled** indicates traps are currently being issued at authentication failure; **Disabled** indicates they are not being issued.

To toggle the authentication-failure traps between an Enabled and Disabled state:

1. Click on the **Enabled/Disabled** command button. A window opens requiring you to confirm the action. Click **OK**; a message displays notifying you of the success of the set action.

NOTE

In order for your device to issue any traps—and in order for your management workstation to receive those traps—your SNMP device's trap table must have been properly configured via Local Management or the Remote Administration Tools application; refer to the hardware documentation or the ***Remote Administration Tools User's Guide*** *for more information. In addition, refer to the* ***Alarm and Event Handling User's Guide*** *for more information on the alarm logging facility.*

Index